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No 3

Economic Intelligence Report

POST AND TELECOMMUNICATIONS SERVICES IN NORTH KOREA 1953–61

CIA/RR ER 62-19

June 1962

CENTRAL INTELLIGENCE AGENCY

Office of Research and Reports

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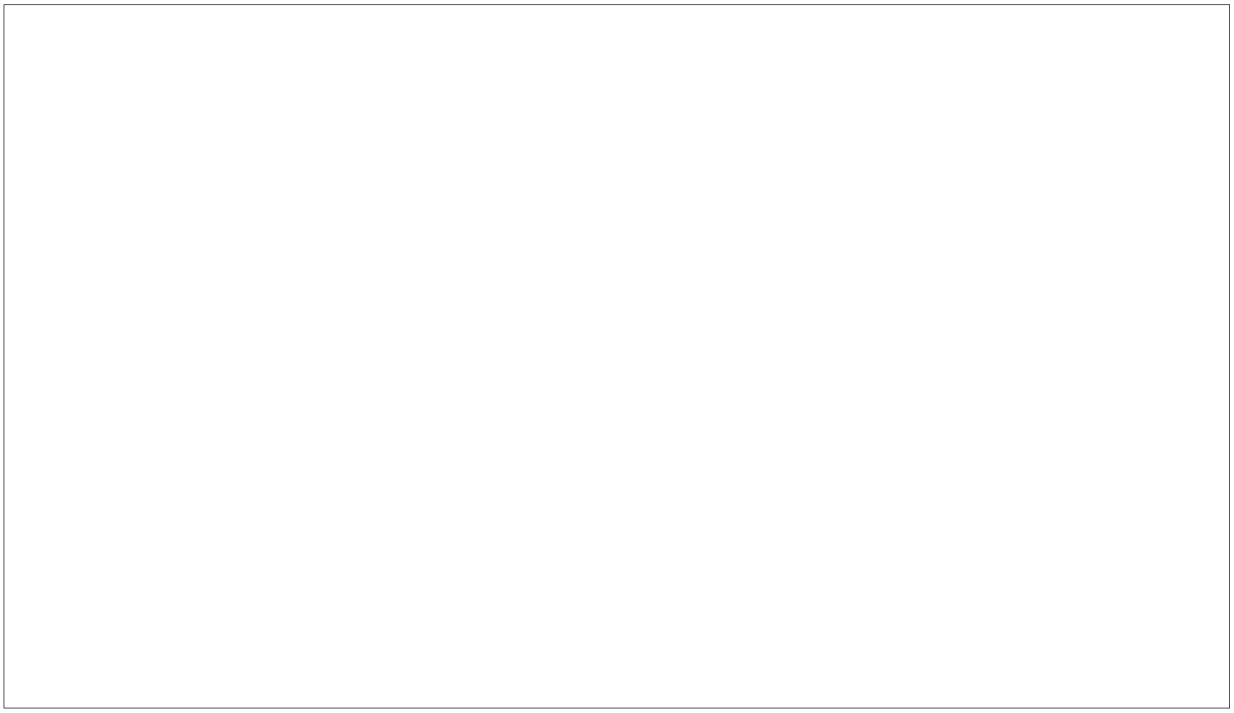
FOREWORD

The continuing threat to the Free World position in South Korea and Japan posed by North Korea, an instrument for carrying out Communist objectives in the Far East, establishes a need for an analysis of the North Korean post and telecommunications sector. The present and future posture of this sector, which is geared to meet strategic as well as economic needs, may reflect the military intentions of the country.

This report, the last in the series on the post and telecommunications sectors of the economies of the Sino-Soviet Bloc,* deals chiefly with the part managed by the Ministry of Communications. It also covers a number of important functional telecommunications networks operated by other segments of government, especially the Ministry of National Defense. Aided by numerous maps, the coverage of these functional networks permits a more solid over-all appraisal of the present and future telecommunications capability of the country. 50X1



* Because of the relative unimportance of Outer Mongolia within the framework of the Sino-Soviet Bloc, this Office does not contemplate preparing a similar report on that country. However, basic studies already completed on various countries of the Bloc will be updated from time to time.

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POST AND TELECOMMUNICATIONS SERVICES IN NORTH KOREA* 1953-61

Summary and Conclusions

In spite of the ravages of the Korean War, which ended in 1953, North Korea, with essential aid from the Sino-Soviet Bloc, has restored the former structure of its post and telecommunications sector and has enlarged this sector to some extent with more modern equipment. By successful completion of the Three Year Rehabilitation Plan (1954-56) and of the Five Year Industrial Development Plan (1957-61), which was fulfilled in 4 years, the sector now can better serve the needs of the growing economy and the country's strategic commitments to the Bloc.

The foremost accomplishment thus far in the post and telecommunications sector of North Korea has been the construction of a national wireline network which is superior to the point-to-point radio network that it superseded. This new network, which ties the country to Pyongyang, its capital, now serves to support the command-control mechanisms of the country. The new Seven Year Plan (1961-67) shows an intention to modernize the entire sector as well as to improve the coverage, the reliability, and the speed of service.

The accompanying map** shows the coverage now given by the general system*** to major areas of economic activity. As can be seen, the wirelines have become much more extensive than the radio lines.

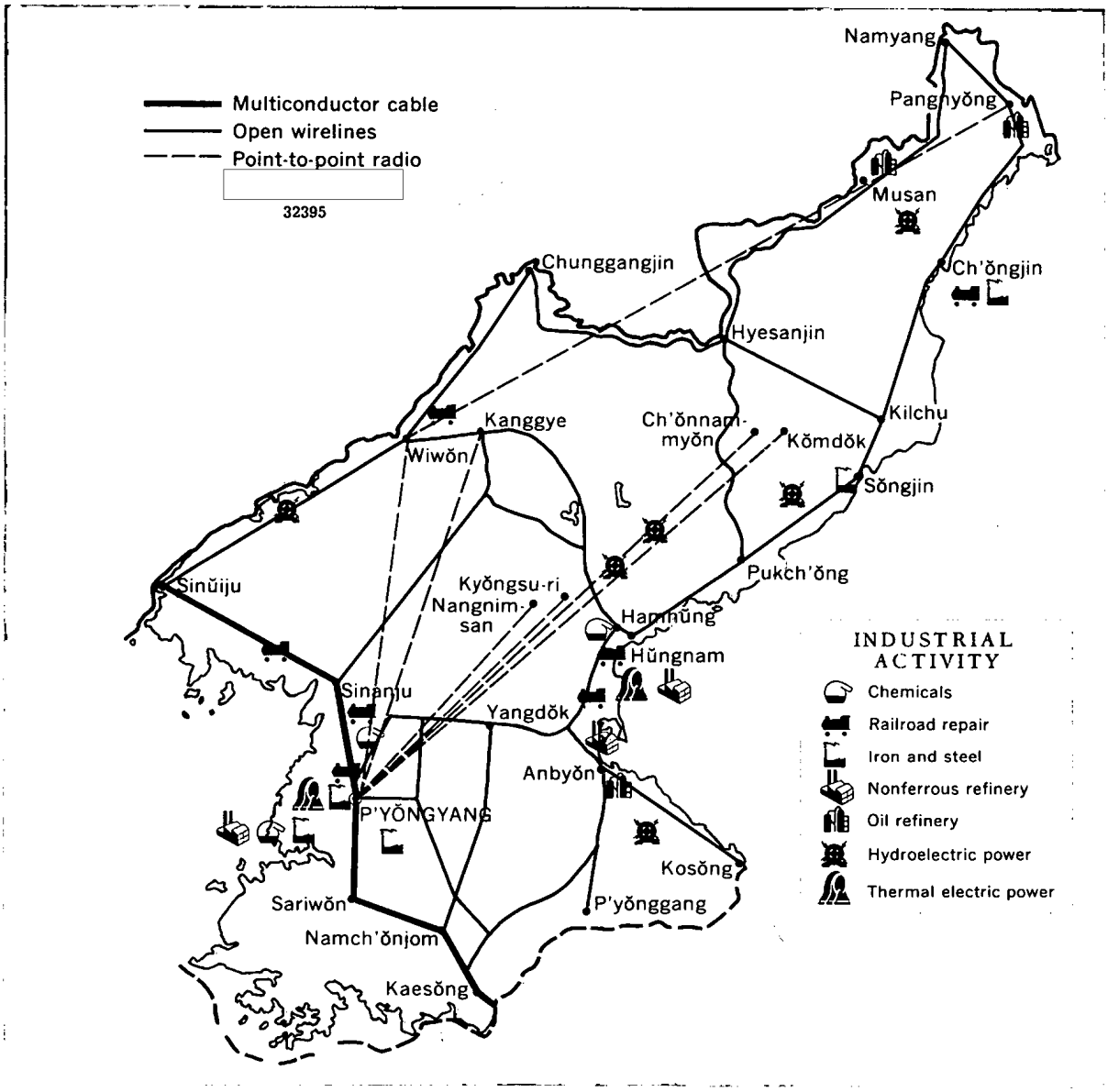
With the exception of telegraph service, the absolute growth of services of the post and telecommunications sector in North Korea from 1953 through 1961, as shown in the accompanying chart,† was extremely rapid. The average annual rate of growth of service volumes during 1954-61 approximated 32 percent for telephone subscribers, 32 percent for interurban telephone calls, 26 percent for radiobroadcast receivers, 88 percent

* The estimates and conclusions in this report represent the best judgment of this Office as of 1 May 1962. For a glossary of technical terms, see Appendix A.

** Following on p. 2.

*** The terms general system and general facilities as used in this report refer to the facilities and services managed by the Ministry of Communications.

† Following on p. 3.



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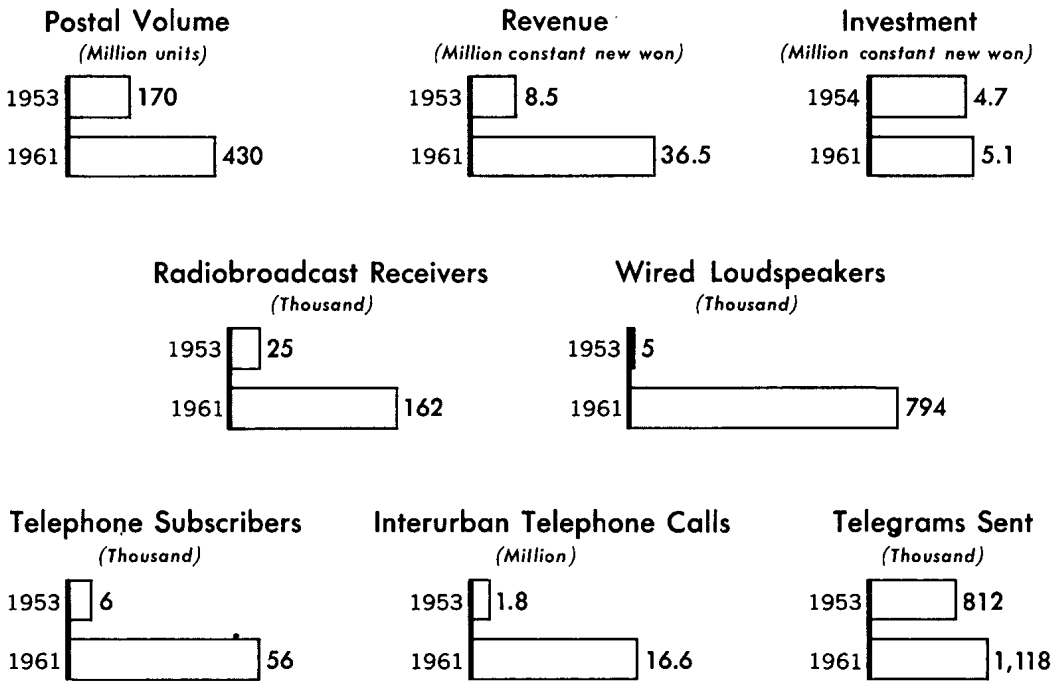
for wired loudspeakers, and 12 percent for postal service. Growth in telegraph service was only 4 percent per year, thus revealing its subordinate role to telephone service. As expected, these sharp increases markedly affected the total revenues, which grew at an annual rate of 20 percent throughout the period. Although investment in this sector was only 27 million won,* or about 8.9 percent of the total of 305 million

* Won values in this report are given in new won and may be converted to US dollars at an estimated rate of exchange of 1.5 won to US $1. This rate does not necessarily reflect the value of the won in terms of the dollar.



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won invested in transportation and communications, this investment was nevertheless sufficient to realize plan objectives.

During the 1953-61 period, military facilities grew side by side with general facilities. Late in 1960, North Korea created a new military point-to-point radio network that increased both traffic capacity and mobility of service for tactical operations. The makeup of the equipment of this network as well as other military networks implies that teletype may become the major mode of military signaling in the future.

Notwithstanding past improvements, the general telecommunications facilities of North Korea by modern standards are still poorly developed. Besides the mediocre grade of service obtainable from open wirelines, dependence on obsolete, manual equipment and shortages of skilled personnel hamper operating efficiency. To overcome these deficiencies, the Seven Year Plan contemplates almost a complete rearrangement and reequipment of the system so as to improve further its responsiveness to current and anticipated needs.

Salient features of the new plan are a greater use of multiconductor cable and the introduction of low capacity microwave radio relay media for arterial routes. Their use will give "hardening" and balance to a

system now burdened by dependence on open wirelines, thus enhancing the dependability of communications in case of war or civil disturbances and probably lessening the concern of North Korean authorities who remember the harmful effects of the disruptions of facilities during the Korean War.

Targets of the Seven Year Plan are ambitious, but prospects for completion are reasonably good. Plan progress will depend largely on the level of aid from the Bloc to compensate for domestic technical and material deficiencies. Continuance of this aid, which was crucial to gains made during previous plan periods, will assure fulfillment of most, if not all, of the plan.

I. Introduction

The land mass of North Korea, an irregularly shaped and mountainous country, encompasses about 48,000 square miles, an area comparable in size to the state of Pennsylvania. Occupying the northern half of the Korean peninsula, North Korea shares common frontiers with South Korea, the only non-Communist country on the northeast Asian mainland, and also with Communist China and the USSR. At the end of 1960 the population of North Korea approximated 10.8 million, a considerable part of which was located in the farming regions along the western coastal plain. The only sizable concentrations of urban population were in the general environs of Pyongyang and the provincial capitals.

North Korea is not highly developed. Nevertheless, its basic economic position is more favorable than that of South Korea. Although lacking in arable land, North Korea contains most of the peninsula's natural resources, 97 percent of the iron ore, 68 percent of the anthracite coal, 85 percent of the hydroelectric power potential, and 60 percent of the forest area. Exploiting these advantages, North Korea during 1954-60 gave priority to the building of an industrialized economy.

During the period 1954-60, gross national product (GNP) grew at an average annual rate of about 15 percent, and industrial production increased about 28 percent per year. In comparison, the annual growth of both GNP and industrial production in South Korea for that same period was only 4.6 percent and 15 percent, respectively. The more dynamic performance of the North Korean economy reflected the industry-oriented investment policies of the regime, the execution of which was dependent on more than US $1.3 billion of aid from the Bloc. 1/*

Even though the contribution to GNP by such basic service sectors as transportation and telecommunications was relatively small, their overall performances contributed to the impressive growth of the North Korean economy during 1954-60. Postwar restoration of telecommunications facilities and their subsequent enlargement made more dynamic the control structure for managing the growing complexities of the economy.

II. Ministry of Communications

All general post and telecommunications facilities in North Korea are owned by the government, being managed by the Ministry of Communications (Chesin Song), which is responsible for providing domestic and international telephone, telegraph, and broadcasting service to state

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and private users. The Ministry also is responsible for the technical control and regulation of all independent functional systems operated by other ministries.

A. Organization

Until the formation of the Democratic Peoples Republic of Korea in September 1948, the general post and telecommunications system of the country was managed by the Communications Bureau of the Peoples Committee of North Korea. At that time the Communications Bureau was abolished, and its duties were transferred to the newly established Ministry of Communications. Since its formation the Ministry has undergone numerous changes, principally relating to the duties of the Minister himself. The chart, Figure 1,* shows the current structure of the Ministry. 2/

Choe Hyon is Minister of Communications, having been appointed to this position in April 1958, at which time he relinquished his post as Deputy Minister of National Defense. Besides managing the over-all activities of the Ministry, the Minister directly controls construction, training, and provincial post and telecommunications activities.

The Minister receives support from two vice-ministers, Pak Pyong Sop and Sin Chon Taek.** Pak Pyong Sop, born in the USSR and a former member of the Communist Party of the USSR, is the first Vice-Minister of Communications. He has been associated with the Ministry since 1952 and during 1955-58 was Acting Minister of Communications. As first Vice-Minister, he supervises the activities of the administrative management, the materials management, and the publications and the postal bureaus. The second Vice-Minister of Communications is Sin Chon Taek, who also was born in the USSR and educated there. Units under his control supervise the installation, operation, and maintenance of all general telephone, telegraph, and broadcasting facilities. In addition, the research and development activities of the Ministry as well as its relations with the Communications Department of the Ministry of Internal Affairs (MIA) also are managed by the second Vice-Minister. 3/

The heavy influence of the Korean Labor (Communist) Party pervades the activities of the Ministry of Communications. Subcells of the Party, which meet at least once a month, are organized within the more important components of the Ministry. To insure execution of Party policies, participation by the Minister and the Vice-Ministers in the workings of these groups is mandatory. 4/

* Following p. 6.

** [redacted] Pak Kyong Byon and Cho Hong Yon also are Vice-Ministers of Communications, but their official duties are not known. 50X1

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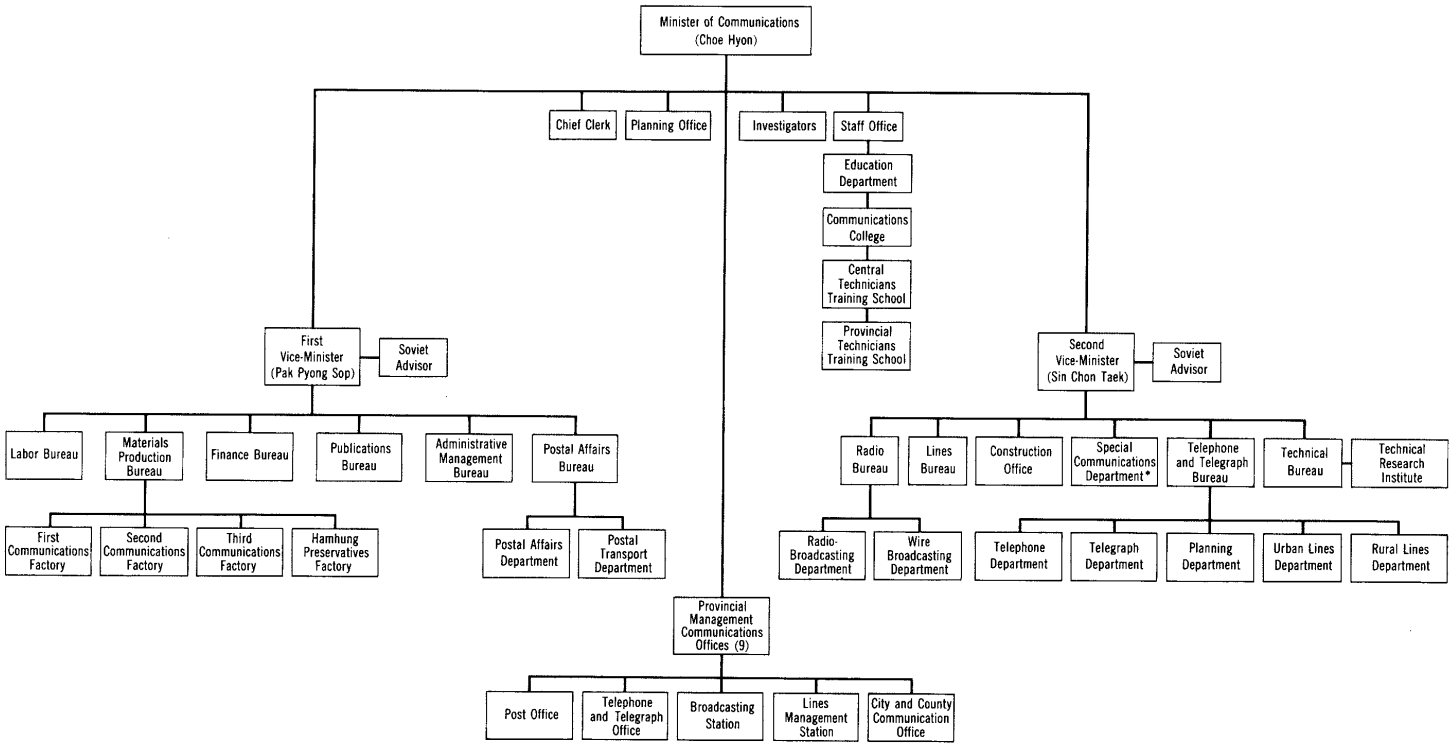
Figure 1

NORTH KOREA: ORGANIZATION OF THE MINISTRY OF COMMUNICATIONS
APRIL 1962



*The Special Communications Department works closely with the Communications Department of the Ministry of Internal Affairs (MIA) in establishing communications codes.

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The presence of Soviet advisors within the Ministry of Communications in addition to the two Soviet-born Vice-Ministers is strongly suggestive of Soviet influence in the affairs of the Ministry. The Soviet advisor assigned to the office of the Minister serves as coordinator between the Minister and his subordinate units, whereas those assigned to offices of the Vice-Ministers help to resolve problems having to do with production and installation of telecommunications equipment. 5/

The Central Broadcasting Committee of North Korea, immediately subordinate to the Cabinet, directs the broadcasting efforts of the country. The Committee is supported by the Radio Bureau of the Ministry of Communications, which operates the broadcasting facilities, and by the Cultural Bureau of the Ministry of Education and Culture, which prepares the programs. The organization of the Central Broadcasting Committee 6/ is shown in the chart, Figure 2.*

North Korea, represented by the Ministry of Communications, is a full member of two organs of the Bloc, known as the Organization for Cooperation Among Socialist Countries in the Fields of Post and Communications (OSS) and the International Radiobroadcasting and Television Organization (OIRT).** These organizations aim to develop post and telecommunications services in and among the countries of the Bloc through the standardized integration of facilities. Thus far, North Korea has not been very active in the activities of OSS, but it has contributed to the work of OIRT, especially in the field of wire diffusion technology. Although meagerness of technical and material resources will continue to limit the role of North Korea in OSS, more active participation may be expected as programs in the field of postal communications are initiated. Such programs, which will not require large allocations of resources, would be well within the capability of the country.

B. Revenue

Growth of post and telecommunications revenue in North Korea during 1954-61 was indeed rapid. The total revenue, as shown in Table 1,*** is estimated to have increased about 330 percent, from 8.5 million won in 1953 to 36.5 million won in 1961. For the entire 9-year period, revenue approximated 188 million won, of which 87 million won came from postal revenue and 101 million won from telecommunications revenue.

The average annual rate of growth in the total revenue and its major components during 1954-61 is shown in the chart, Figure 3.† Growth††

* Following p. 10.

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*** Table 1 follows on p. 8.

† Following p. 10.

†† Text continued on p. 10.

Table 1

Estimated Revenue of the Ministry of Communications of North Korea a/*
1953-61

Million Constant (1959) New Won

	1953	1954	1955	1956	1957	1958	1959	1960	1961
Postal revenue b/	5.7	6.7	7.6	8.6	9.5	10.8	11.8	12.7	13.6
Letters c/	2.9	3.5	4.0	4.5	5.0	5.2	5.4	5.6	5.8
Parcel post d/	Negl.	Negl.	Negl.	0.1	0.2	0.2	0.3	0.4	0.4
Newspapers and periodicals e/	2.8	3.2	3.6	4.0	4.3	5.4	6.1	6.7	7.4
Telecommunications revenue	2.8	4.9	7.5	8.1	9.1	11.2	15.0	20.0	22.9
Telephone f/	1.6	3.5	5.8	5.9	6.4	8.2	9.9	12.5	13.7
Interurban g/	1.0	2.3	4.4	4.4	4.7	5.9	7.1	8.3	9.4
Local h/	0.4	1.0	1.3	1.4	1.6	2.1	2.6	3.8	4.2
Installation i/	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.4	0.1
Telegraph j/	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.4
Broadcast k/	0.2	0.4	0.7	1.1	1.5	1.8	3.8	6.2	7.8
Radiobroadcast	0.2	0.3	0.5	0.8	1.0	1.0	1.1	1.2	1.4
Wire diffusion	Negl.	0.1	0.2	0.3	0.5	0.8	2.7	5.0	6.4
Total post and telecommunications revenue	8.5	11.6	15.1	16.7	18.6	22.0	26.8	32.7	36.5

* Footnotes for Table 1 follow on p. 9.

Table 1

Estimated Revenue of the Ministry of Communications
of North Korea a/
1953-61
(Continued)

a. The revenue for each of the services was derived by applying known or estimated post and telecommunications price data to known or estimated post and telecommunications service volumes, as shown below for the specific services.
b. Excluding money order revenue, which was negligible.
c. Computed by multiplying the volume of letters for 1953-61 from Table 3 (p. 16, below) by the estimated average revenue of 0.1 won per unit. 8/
d. Computed by multiplying the volume of parcel post for 1953-61 from Table 3 (p. 16, below) by the estimated average revenue of 0.7 won per unit. 9/
e. Computed by multiplying the volume of newspapers and periodicals for 1953-61 from Table 3 (p. 16, below) by the estimated average revenue of 0.02 won per unit.
f. Because of obscurities in the data reported, the total telephone revenue does not include charges in excess of the annual base rate.
g. Derived from data for interurban telephone calls from both regular and leased circuits. Revenue from regular circuits was computed by multiplying the number of calls for 1953-61 from Table 5 (p. 20, below) by the estimated average revenue of 0.4 won per call. 10/ Revenue from leased circuits was assumed to be 30 percent of the total interurban telephone revenue.
h. Computed by multiplying the number of telephone subscribers for 1953-61 from Table 4 (p. 19, below) by the estimated average annual telephone rate of 75 won per subscriber. 11/
i. Computed by multiplying the number of new telephone subscribers for 1953-61 by an estimated installation fee of 25 won. The 1953 figure was computed by multiplying the end-of-the-year number of subscribers by the installation fee of 25 won.
j. Derived from the figure for telegrams from both regular and leased telegraph circuits. Revenue from regular circuits was computed by multiplying the number of telegrams sent for 1953-61 from Table 6 (p. 22, below) by the estimated average revenue of 1 won per telegram. 12/ Revenue from leased circuits was assumed to be 20 percent of the total telegraph revenue.
k. Computed by multiplying the estimated end-of-the-year figure for radiobroadcast and wire diffusion subscribers for 1953 and the estimated midyear figure for subscribers for 1954-61 derived from Table 7 (p. 30, below) and Table 8 (p. 31, below) by the annual subscriber tax of 8 won and the permit fee of 1 won. 13/ There are no installation fees for wire diffusion subscribers in North Korea.

in the total revenue was rapid, amounting to 20 percent per year. For the same period the rates of growth in postal revenue and in telecommunications revenue were 11 percent and 30 percent, respectively. The high rate of growth in telecommunications revenue during 1954-55 and 1958-60 dominated the total revenue performance. The level of the total revenue during the early period reflected the general upsurge in telecommunications services resulting from the restoration of facilities destroyed during the war, whereas that during 1957-60 showed the accelerated growth in telephone and wire diffusion services consonant with major goals of the First Five Year Plan.

Revenue derived from telecommunications services for the entire period accounted for only 54 percent of the total revenue, but its proportion has increased steadily. Whereas its share in 1953 was only 33 percent, by 1961 it had increased to 63 percent. Expansion in telephone service throughout the period and growth in wire diffusion service, especially during 1959-61, were the main causes of this change.

Telephone revenue consistently accounts for the major part of the total telecommunications revenue, contributing about 60 percent in 1961. In that same year, broadcasting revenue accounted for about 34 percent and telegraph revenue for the remaining 6 percent. The ratio of broadcasting revenue to the total telecommunications revenue has increased steadily since 1953, at which time it was less than 10 percent. Conversely, the proportion of telegraph revenue, which was 36 percent in 1953, has declined continually.

Growth in the total post and telecommunications revenue during the Seven Year Plan period (1961-67) may be more moderate than that for 1953-61, reflecting an expected leveling off in growth of service volume. Absolute increases in postal and telegraph revenues are likely, but the contribution of each to the total revenue probably will decline. Revenues derived from telephone and wire diffusion services should continue to spearhead growth in the total revenue because investment plans of the Ministry emphasize construction of facilities to provide more of these services.

C. Investment

The estimated investment in post and telecommunications in North Korea during 1954-61, as shown in Table 2,* increased about 8.5 percent, from 4.7 million won in 1954 to 5.1 million won in 1961. For the entire period, investment was about 27 million won, or 8.9 percent of the total of 305 million won invested in transportation and communications. Although the absolute amount invested in post and telecommunications was

* Table 2 follows on p. 11.

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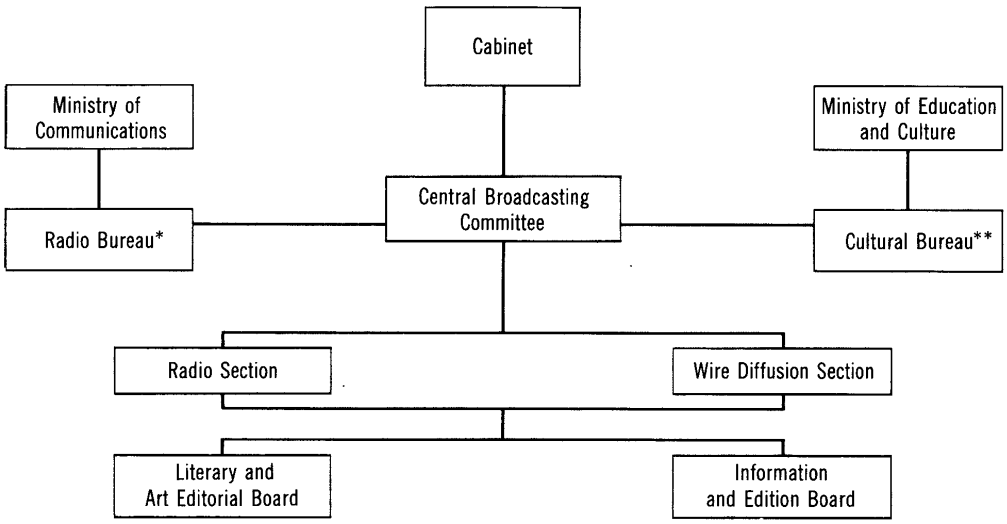
Figure 2

NORTH KOREA
ORGANIZATION OF THE CENTRAL BROADCASTING COMMITTEE
APRIL 1962



*The Radio Bureau of the Ministry of Communications provides the facilities, equipment, and technical personnel for the transmission and relay of programs of the Central Broadcasting Committee.

**The Cultural Bureau of the Ministry of Education and Culture makes the selection of programs to be prepared for broadcasting by the Central Broadcasting Committee.

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Figure 3

NORTH KOREA: ESTIMATED RATES OF GROWTH OF POST AND TELECOMMUNICATIONS REVENUE, 1953-61

Million Constant New Won

Year	TPTR	TR	PR
1953	8.5	2.8	5.7
1954	11.6	4.9	6.7
1955	15.1	7.5	7.6
1956	16.7	8.1	8.6
1957	18.6	9.1	9.5
1958	22.0	11.2	10.8
1959	26.8	15.0	11.8
1960	32.7	20.0	12.7
1961	36.5	22.9	13.6

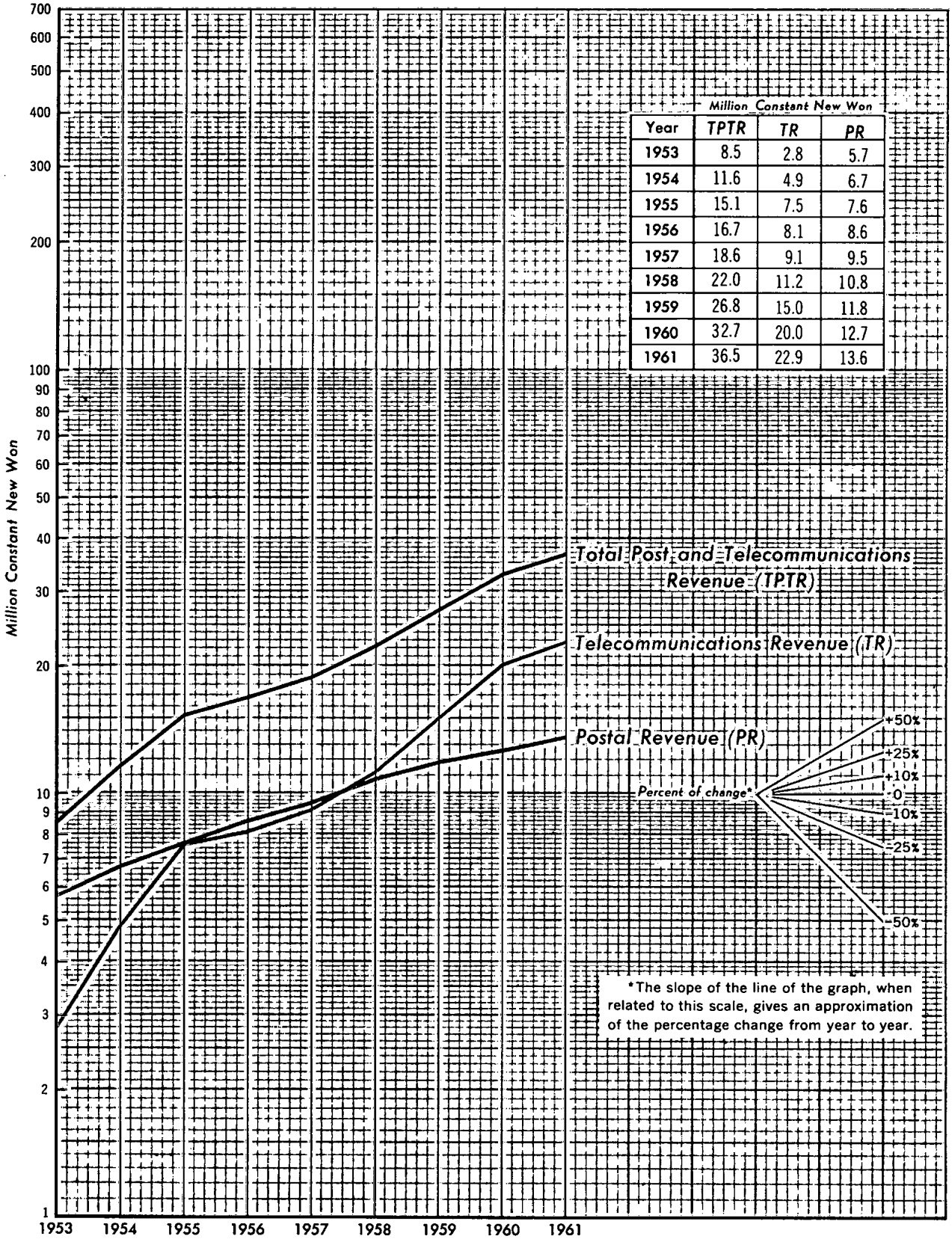

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Table 2

Estimated Investment in Post and Telecommunications
in North Korea a/
1954-61

Million Constant New Won b/

Year	Budgeted State Investment	Transportation and Communications Investment	Post and Telecommunications Investment
1954	248	50	4.7 c/
1955	293	35	3.3 c/
1956	264	21	2.0 c/
1957	271	17	1.6
1958	341	26	2.2
1959	426 d/	43 e/	3.6 f/
1960	511 d/	52 e/	4.3 f/
1961	600 d/	61 e/	5.1 f/

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b. Based on price levels as of 1 January 1950.
c. Assuming the same percentage relationship of post and telecommunications investment to transportation and communications investment for 1954-56 as for 1957.
d. Estimated on the basis that budgeted state investment was 85 percent of the total investment. 15/
e. Estimated on the basis that transportation and communications investment was 10.1 percent of the budgeted state investment. 16/
f. Assuming the same percentage relationship of post and telecommunications investment to transportation and communications investment for 1959-61 as for 1958.

relatively small, it nevertheless was sufficient to permit both the rehabilitation of facilities and services almost completely destroyed during the Korean War and the installation of some new ones. Construction of new facilities was tied directly to substantial amounts of financial, material, and technical aid received from the countries of the Bloc, particularly the USSR, East Germany, Hungary, and Communist China.

Two distinct trends are apparent in the growth of post and telecommunications investment in North Korea throughout the 8-year period. During the Three Year Rehabilitation Plan (1954-56), investment, as shown in the chart, Figure 4,* declined progressively from the peak attained in 1954. This downward trend carried over into 1957, the first year of the Five Year Industrial Development Plan, but investment surged upward in 1958, so that by the end of 1960 its level was comparable to that achieved in 1954. In spite of the decline, investment performance during 1954-56 was adequate to meet annual plan goals for restoring the sector to its prewar status. After high initial capital inputs, investment programs for rehabilitation purposes usually are characterized by decreasing increments of funds. The acceleration of investment during 1958-60 was in accord with efforts to complete major goals of the Five Year Plan 1 year ahead of schedule.

The average annual rate of growth of investment in the post and telecommunications sector during 1955-61 was much lower than that of the total state budgeted investment, 1.2 percent compared with 13.5 percent. This differential suggests that the sector developed at a rate too low to meet the expanding service needs of the economy. The over-all rate of growth of investment in the sector, however, primarily reveals the debilitating effect of decreases in investment during 1955-56 and thus does not give proper focus to investment performance during the Five Year Plan. Since the end of 1957, sector investment grew, in fact, at a rate significantly greater than that of the budgeted state investment, 34 percent compared with 22 percent. Expansion of facilities resulting from this rapid growth probably was sufficient to establish a balance between the supply and demand for service.

During the Seven Year Plan the continued growth of investment in the post and telecommunications sector is expected but at a rate somewhat lower than that in the previous 5 years. Investment should be sufficient, nevertheless, to implement major goals of the plan. These goals include projects to rearrange open wireline routes; to interconnect major industrial areas with multiconductor cable lines; to improve the quality of telephone, telegraph, and postal services; to extend the coverage of wire diffusion service; and to introduce television service in most major cities.

* Following p. 12.

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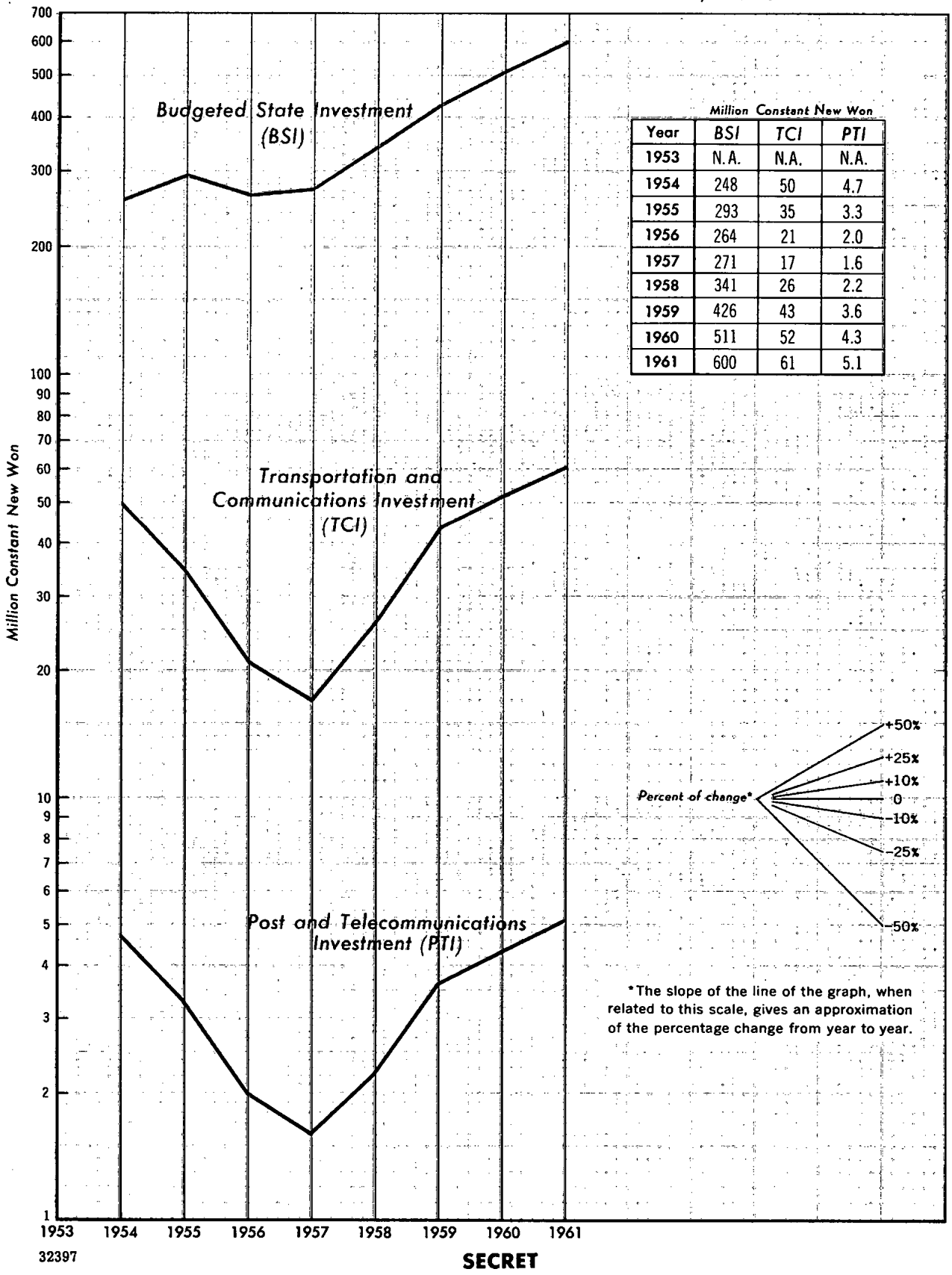
Figure 4

NORTH KOREA: ESTIMATED RATES OF GROWTH OF POST AND TELECOMMUNICATIONS INVESTMENT, 1954-61



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D. Manpower and Training

During 1955-61, employment in the post and telecommunications sector of North Korea increased appreciably. At the end of 1954 the labor force comprised some 12,000 workers. By 1961 the number had grown to about 21,000,* an increase of 75 percent. Of this total, more than 50 percent were women, employed mainly as telephone operators, line repairers, and postal workers. This extensive use of women is dictated by shortages of labor prevalent throughout the country. 17/

As is true of other sectors of the economy, the post and telecommunications sector suffers from a severe lack of skilled personnel. To ease the burden, the Ministry of Communications has broadened its domestic training efforts and at the same time has sent many workers to other countries of the Bloc for technical training. Major training facilities operated by the Ministry include the Communications College and the Central Technicians Training School, both located in Pyongyang, and the Provincial Technicians Training Schools located in each of the nine provinces of the country. The Communications College offers a 4-year course in various phases of telecommunications technology, whereas the Central and Provincial Technicians Training Schools stress specialized programs of lower level and shorter duration. The current total enrollment is about 2,400 students. 18/

In spite of some relief, these added training efforts have not yet materially altered the urgent need for qualified technical personnel. This deficiency is perhaps the major impediment to efficient operation and improved service.

The introduction of modern automatic and semiautomatic equipment planned during 1961-67 undoubtedly will intensify the problem of shortages of skilled personnel. The use of this new apparatus will require levels of technological skill even higher than those now needed. It is likely, therefore, that a further acceleration in the training activities of the Ministry, at least during the early stages of the plan, will occur. The magnitude of growth in labor productivity, which is set to rise 20 percent during the Seven Year Plan, should give insight into the effectiveness of this enlarged program. 19/

* Data on the current size of the post and telecommunications labor force are sketchy. On the basis of the ratio existing in 1954, the figure for 1961 was derived by assuming that post and telecommunications workers comprised 18 percent of the estimated 114,000 transportation and communications workers.

E. Equipment and Technology

Production of telecommunications equipment in North Korea is confined to minor items, such as telephone handsets, batteries, telephone poles, spare parts for switchboards, wired loudspeakers, and some radiobroadcast receivers. Major plants producing this equipment consist of the First, Second, and Third Communications Factories; the Hamhung Preservative Factory; and the Nampo Communications Equipment Factory. With the exception of the Nampo factory, which is the major producer of wired loudspeakers in the country, all these plants are controlled by the Materials Production Bureau of the Ministry of Communications. The Nampo Factory is subordinate to the Heavy Industry Commission. 20/

These scant production resources, as well as the general backward state of telecommunications technology, have forced the Ministry of Communications to rely almost entirely on imports from other countries of the Bloc to meet its basic equipment needs. Of these countries the USSR, Hungary, East Germany, and Communist China are the major suppliers, accounting for more than 90 percent of all equipment imported by the Ministry in the last 8 years. Imports during this period have included radiobroadcasting, teletype, and point-to-point radio equipment from the USSR; telephone, telegraph, and wire diffusion equipment from Hungary; telephone exchange and carrier frequency telephone equipment from East Germany; and copper wire and spare parts from Communist China. Execution of plans to introduce microwave radio relay communications and television broadcasting service in the near future will depend on importation of this equipment from Hungary and East Germany, respectively. 21/

The level of research and development activities in the field of telecommunications in North Korea is very low. Besides the Technical Research Institute of the Ministry of Communications, the only other known entities active in the field are the Academy of Sciences and a few engineering colleges. On the whole, their efforts are quite rudimentary, reflecting shortages of both competent engineering personnel and adequate research facilities. The only significant achievement came in 1958, when researchers at the Technical Research Institute developed a relatively inexpensive device to effect transmission of wire diffusion broadcasts over electric power lines. This device has hastened the expansion of service to rural areas, underway since 1959. 22/

Not much progress is expected in the near future in the research, development, and production of telecommunications equipment in North Korea. Although some expansion of productive facilities will occur, the output of these facilities will be more or less limited to replacement parts. It is clear, therefore, that the Ministry will continue to depend heavily on imports from other countries of the Bloc.

III. Postal Services

The postal system of North Korea, managed by the Postal Affairs Bureau of the Ministry of Communications, provides domestic and international service to meet the needs of government and the public. At the end of 1961 the system consisted of a nationwide network of about 600 main post offices and an indeterminate number of postal handling stations that offered regular services as well as a variety of specialized services including money order, postal savings, and telegram delivery. Also, all main post offices and a large number of postal handling stations offer telephone and telegraph service to the public. In the main, the system uses surface transport for the handling of mail, but airmail service is available between Pyongyang and Sinuiji, between Pyongyang and Chongjin, and to the USSR and all the European Satellites. 23/

Estimates of postal volume for 1953-61 are shown in Table 3.* Throughout the period the volume of newspapers and periodicals far surpassed that of all other types of postal matter, representing about 86 percent of the total in 1961 -- a proportion more than six times as great as that for the number of letters sent. This predominance of newspapers and periodicals attests to the formidable efforts of the regime to widen its domestic propaganda base through the controlled use of all media of mass communications, written and oral. Accordingly, the government, since the cessation of hostilities, has moved to increase greatly the number of publications in circulation. As might be expected, the Party has been the chief motivating force in the preparation of this new printed matter, with the Publications Bureau of the Ministry of Communications responsible for its sale and delivery. 24/

International postal service is available to all countries of the Bloc and to some countries of the Free World. There are, however, no postal exchanges between North Korea and South Korea. Fearing that such exchanges would lead only to an influx of subversive materials, South Korea has spurned suggestions to establish postal relations with the North. Nevertheless, in 1960 more than 80,000 pieces of mail from North Korea reached South Korea via third countries. 25/

Censorship regulations, supposedly suspended at the end of the Korean War, are still in force on correspondence between the military and civilians. All other mail, domestic and foreign, is subject to a new, but more limited, form of censorship known as "inspection." About twice a week, personnel of the Ministry of Internal Affairs visit communications offices on the provincial management level for this purpose. On a random basis, mail containing printed matter or using envelopes of foreign manufacture usually is opened. 26/

* Table 3 follows on p. 16.

Table 3

Estimated Postal Volume in North Korea a/
1953-61

Million Units

	1953	1954	1955	1956	1957	1958	1959	1960	1961
Letters	29.4	34.6 b/	39.8 b/	44.9	50.4	52.3	54.2 c/	56.1 c/	58.0 c/
Parcel post	Negl.	Negl. b/	Negl. b/	0.2	0.3	0.3	0.4 d/	0.5 d/	0.6 d/
Money orders	0.1	0.2 b/	0.3 b/	0.4	0.5	1.2	1.9 c/	2.6 c/	3.3 c/
Newspapers and periodicals	140.0	160.7 b/	181.4 b/	202.2	213.7	269.5	303.1 e/	336.7 e/	370.3 e/
Total postal volume	169.5	195.5	221.5	247.7	264.9	323.3	359.6	395.9	432.2
Index of postal volume (1953 = 100)	100	115	131	146	156	191	212	234	255

50X1

b. Interpolated, using graphic analysis.
c. Extrapolated by applying the absolute increase during 1958.
d. Extrapolated by applying the absolute increase during 1957-58.
e. Extrapolated by applying the average annual absolute increase during 1957-58.

In spite of improvements during the Five Year Plan, such as the reorganization of postal routes and the construction of additional post offices, the system provides, at best, only marginal service. Dependence on outmoded handling practices has resulted in slow, inefficient service, and loss of mail is frequent. In 1959, for example, delivery of mail between the metropolitan areas of Pyongyang and Hamhung, a distance of 115 miles, took nearly 4 days. In that same year, even longer delays occurred in service to villages because such mail was not delivered directly to the addressee but rather to a central distribution point for pickup by the individual. 28/

The Seven Year Plan gives considerable attention to these deficiencies. It prescribes the introduction of automatic and semiautomatic equipment for the processing of mail, the construction of new post offices, the extension of postal routes, the introduction on a wider scale of vehicular transports, and the expansion of formal and on-the-job training programs. The plan also stipulates strict enforcement of a 1960 directive requiring direct delivery mail service to households in rural communities. This requirement will be accomplished by the establishment of additional postal handling stations that will serve a minimum of four to six villages in a 10-mile radius. 29/

The completion of this ambitious program not only will bring the postal system of North Korea up to more modern standards but also will be consistent with OSS policies for the over-all improvement of the postal operations of member countries. In line with its OSS commitments, North Korea is already trying to extend its international service and to establish a uniform rate structure. In recent years, Korean-Chinese postal exchange bureaus have been established at Pyongyang, Sinuiju, Manpo, Hyesan, and Nampo. 30/

IV. Telephone and Telegraph Services and Facilities

Domestic and international telephone and telegraph services in North Korea are provided by an integrated telecommunications system. Managed by the Telephone and Telegraph Bureau of the Ministry of Communications, the system features wireline and point-to-point radio facilities. Since 1956, wireline has largely displaced radio as the principal medium for handling domestic traffic. Point-to-point radio, which had been foremost in the early postwar period, is still heavily relied on for international services, for domestic services to areas not covered by wirelines, and for backup purposes. Although these facilities fall far below modern technological standards in all respects -- capacity, reliability, and speed of service -- they are still adequate to meet basic needs.

A. Telephone

Regardless of its generally backward state, the telephone system of North Korea is sufficient to meet the limited needs of the country. Service is available to all centers of industrial activity as well as to most urban and many rural areas. The system has widespread geographic coverage, servicing all of the 167 kun (counties) and more than 90 percent of the 3,634 ri (villages), but its coverage is concentrated mainly in large metropolitan areas, such as Pyongyang and the provincial capitals. Rural coverage consists primarily of telephones located at a few central points, ordinarily the administrative or agricultural cooperative headquarters.

The telephone system has developed rapidly since the end of the Korean War. Growth in the number of telephone subscribers and in the number of interurban calls from 1953 through 1961, as shown in Table 4* and Table 5,** respectively, approximated 32 percent per year. Even though the base is small, as expected in underdeveloped areas, these rates of growth are impressive. To a great extent they point up the progress made both in restoring the telephone system to prewar service levels during the Three Year Plan and in enlarging the system during the Five Year Plan. Significantly, by the end of 1960, the volume of interurban calls was 15 times the volume of telegrams sent, indicating that the telephone network is by far the dominant telecommunications service.

Other than telephones installed in post offices or postal bureaus, little service is available to the public. In 1955, 95 percent of the service was given to government subscribers. This ratio probably has not changed since then, because increments in service capacity were largely absorbed by increments in industrial growth.

The telephone network uses manual and automatic telephone exchange equipment. Manual exchanges located in large cities have a capacity of 500 lines or more, whereas those in smaller towns and rural areas vary in capacity from 10 lines to 100 lines. In 1956, automatic exchanges accounted for somewhat more than 3 percent of the total subscriber line capacity, but by the end of 1961 their share had increased to about 27 percent. Located in key urban areas, all automatic exchanges were installed after the war with aid from the Bloc. Since then, the countries of the Bloc have assisted in the construction of new automatic exchanges of varying capacities in cities such as Pyongyang, Hamhung, Sinuiju, Sariwon, and Wonsan. In 1957, East Germany installed a 6,000-line automatic exchange in Pyongyang. Housed in a new four-story building, this exchange is the largest in North Korea. It can be enlarged to 10,000 lines, and full utilization probably is underway if not already achieved. 31/

* Table 4 follows on p. 19.
** Table 5 follows on p. 20.

Table 4

Estimated Number of Telephone Subscribers in North Korea
1953-61

Thousand

	1953	1954	1955	1956	1957	1958	1959	1960	1961
Subscribers	6 a/	13 a/	17 b/	19 c/	22 d/	28 e/	34 f/	51 g/	56 h/
Index of telephone subscribers (1953 = 100)	100	220	280	320	370	470	570	850	930

a. 32/
b. 33/
c. 34/
d. 35/
e. 36/
f. 37/
g. 38/
h. 39/

Table 5

Estimated Number of Interurban Telephone Calls Handled
over Facilities of the Ministry of Communications
of North Korea a/
1953-61

Million

	1953	1954	1955	1956	1957	1958	1959	1960	1961
Interurban calls	1.8	3.9 b/	7.7 b/	7.8	8.2	10.3	12.4 c/	14.5 c/	16.6 c/
Index of interurban telephone calls (1953 = 100)	100	220	430	430	460	570	690	810	920

50X1

b. 41/
c. Extrapolated by applying the absolute increase during 1958.

Overdependence on manual facilities, a lack of exchange and wireline capacities, and the generally poor condition of outside plant facilities seriously hamper efficient operation. As a result, service is slow and of poor quality. Inordinate delays occur in completing long-distance calls between Pyongyang and the outlying provinces, and often connections are not made at all. Even when calls are completed, the quality of transmission is badly degraded by noise from wire broadcast signals carried over the same wireline.

The Seven Year Plan provides for substantial improvement in telephone service. Major projects entail installation of additional automatic exchanges to service main urban and provincial centers, conversion of existing rural exchange facilities to semiautomatic operation, reorganization of main open wireline routes, construction of multiconductor cable on some mainline routes, establishment of separate wirelines to handle wire broadcasts, and initiation of comprehensive programs of preventive maintenance. By the end of 1967, according to the plan, automatic exchanges will account for 50 percent of the total subscriber line capacity, utilization of the total exchange capacity will be greater than 80 percent, and all villages will be connected to the telephone system so as to serve the labor brigades of the agricultural cooperatives. 42/

B. Telegraph

The telegraph network of North Korea gives domestic and international service to state and private subscribers. Whereas point-to-point radio is the main medium for international telegraph service, domestic traffic is almost wholly carried over wirelines used in common with the telephone system. Communities not connected to the telephone system are served either by specially constructed telegraph wirelines or by point-to-point radio. With the exception of facsimile service between Pyongyang and Peking introduced late in 1960, the network offers regular telegraph service only. The relatively backward state of the economy obviates the need for specialized telegraph services.

Since the end of the war, telegraph service has developed at a rate far below the rates for other telecommunications services. From 1953 through 1961 the volume of telegrams sent, as shown in Table 6,* increased only 38 percent, or about 4 percent per year. In comparison with that for telephone service, this moderate rate of growth clearly shows the subordination of telegraph service to telephone service, at least for domestic purposes. Strikingly, the number of interurban calls completed in 1961 was about twice the number of telegrams sent for the entire 1953-61 period.

* Table 6 follows on p. 22.

Table 6

Estimated Number of Telegrams Sent in North Korea a/
1953-61

Thousand

	1953	1954	1955	1956	1957	1958	1959	1960	1961
Telegrams sent	812	824 b/	836 b/	848	942	986	1,030 c/	1,074 c/	1,118 c/
Index of telegrams sent (1953=100)	100	101	103	104	116	121	127	132	138

[redacted] 50X1

b. Interpolated, using graphic analysis.
c. Extrapolated by applying the absolute increase during 1958.

The operating efficiency of the telegraph network is low. Although some automatic Morse and teletype equipment is in use between Pyongyang and the provincial capitals, most traffic is handled by manual Morse facilities. In addition to the usual delays associated with this obsolete mode of telegraphic signaling, reliance on cumbersome manual switching facilities for the relay of traffic adds 50 minutes to transit time. In 1961 the transmission time of a telegram, including delivery to the recipient, took from 1 to 2 days. 44/

Under the Seven Year Plan, telegraph service will be improved. Manual Morse facilities are to be replaced by automatic types, and automatic switching equipment is to be widely used. Inasmuch as nearly 71 percent of all telegraph traffic requires relay, the introduction of this new equipment should result in more timely service. 45/

C. Common Telecommunications Facilities

1. General Facilities

The status of the telecommunications system of North Korea depends on the operational capability of the common telecommunications facilities operated by the Ministry of Communications. Consisting of wireline and point-to-point radio networks only, these facilities carry the bulk of the basic telephone, telegraph, and broadcasting traffic of the country. At present the wireline network is the backbone medium, providing "thick" arterial routes between Pyongyang and all major industrial and military areas. During 1961-67 its enlargement will feature "hardened" underground multiconductor cable facilities. In addition, microwave radio relay and possibly scatter communications likely will be introduced on some main routes. Besides being ideally suited to the rugged, mountainous terrain of the country, these media would add to the flexibility of the telecommunications system as a whole.

a. Wirelines

Comprised mainly of open wirelines, the general wireline network, as shown on the map, Figure 5,* gives extensive coverage. Tying Pyongyang to the rest of the country, the network services the communications requirements of government and, to a more limited extent, those of the public. In the face of disadvantages stemming from dependence on outmoded equipment, shortages of skilled operating and maintenance personnel, and adverse terrain and climatic conditions, network performance is still adequate to meet most critical needs.

Under the impetus of the Three Year Plan and the Five Year Plan, the wireline network has developed rapidly. During 1954-56, high

* Following p. 24.

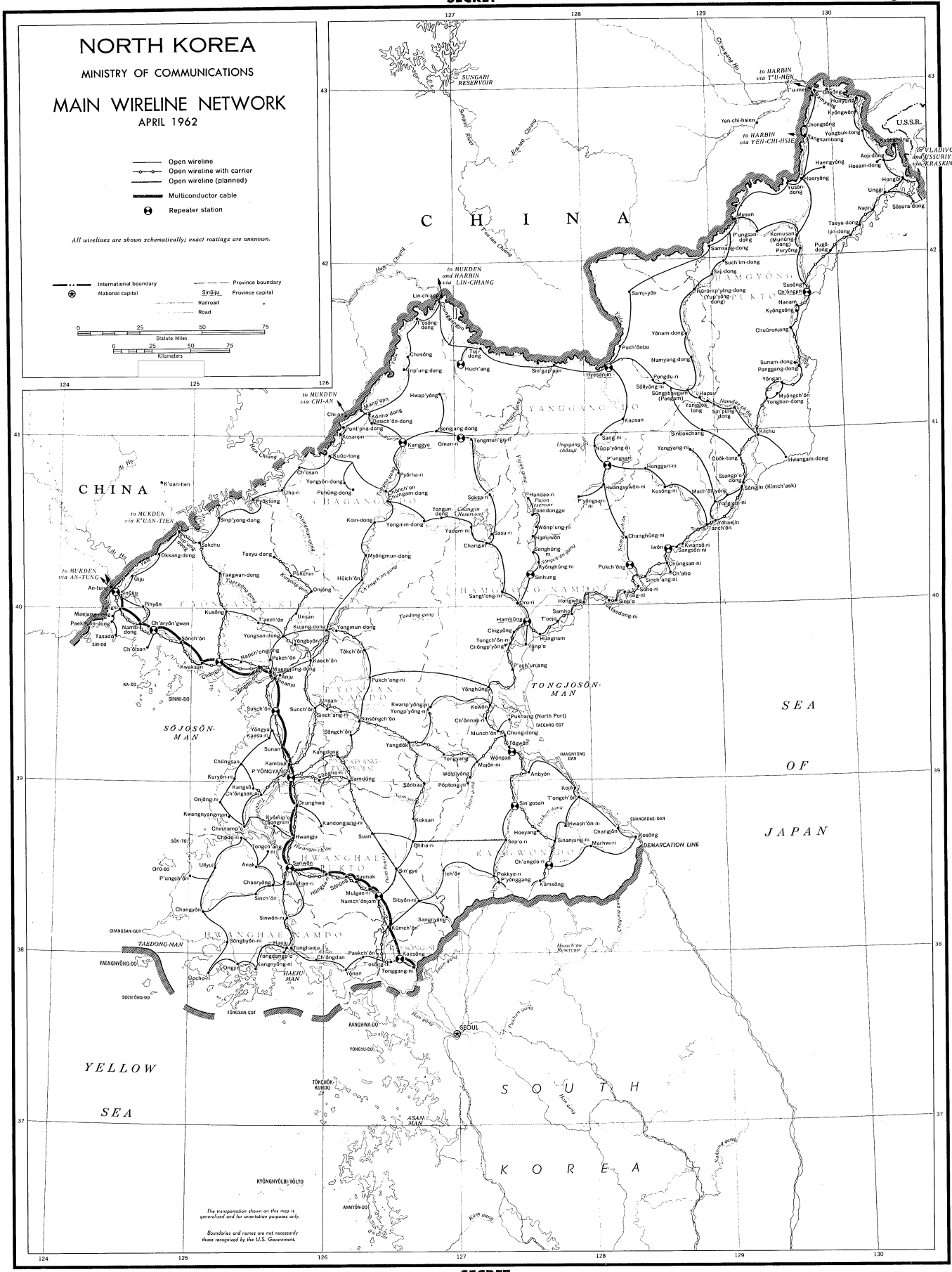
priority was given to postwar reconstruction. Because prolonged bombing had disrupted most key wireline routes, their restoration was mandatory for the functioning of the economy. With rehabilitation largely completed by the end of 1956, a Five Year Plan was introduced. Completed in 4 years, this plan sought to modernize and extend further the geographical coverage of the network. New wirelines were constructed, especially in rural areas, and three-channel telephone carrier frequency equipment was installed on some long-haul routes. As a result, the circuit capacity of the network was more than doubled, and coverage was extended to newly developing agricultural areas. The key to the progress made during both plans was the substantial aid received from countries of the Bloc which largely overcame the almost complete absence of domestic supply. 46/

Notwithstanding past improvements, the wireline network is still poorly developed by modern standards. With the exception of the underground multiconductor cable connecting Kaesong, Pyongyang, and Sinuiju, all facilities are located above ground, making the network highly vulnerable to physical disruption. Furthermore, because the network radiates from Pyongyang and a few key coastal cities, destruction of wireline facilities in these cities would effectively isolate large industrial and administrative centers from other parts of the country. Communications between Pyongyang and other capitals in the Bloc, however, could be maintained over the underground cable.

Besides imposing severe restrictions on the grade of telephone service, the preponderance of open wirelines results in frequent interruptions. This situation is particularly true in the north, where extreme winters and inadequate flood control practices impede maintenance efforts. Consequently, the Seven Year Plan directs almost a complete renovation of the network. Major goals include consolidation and expansion of open wireline routes, replacement of wooden poles with ferroconcrete types, installation of underground multiconductor cable on "thick" routes, conversion of the open wireline system in Pyongyang to underground lines, and initiation of rigid preventive maintenance schedules. To increase the circuit capacity of long-distance routes, substantial amounts of 12-channel telephone carrier frequency equipment will be installed on existing and new lines. Changes contemplated in the configuration, equipment, and capacity of the network will add to its flexibility and reliability. Thus network performance will be more in keeping with the current and anticipated needs. 47/

Emphasis on the use of multiconductor cable may signify that the Ministry of Communications plans to develop a "hardened" telecommunications system. In such a system, cable lines and associated repeater equipment are buried to depths between 3 to 5 feet and bypass all strategic areas. Spur lines connect these areas to the main lines.

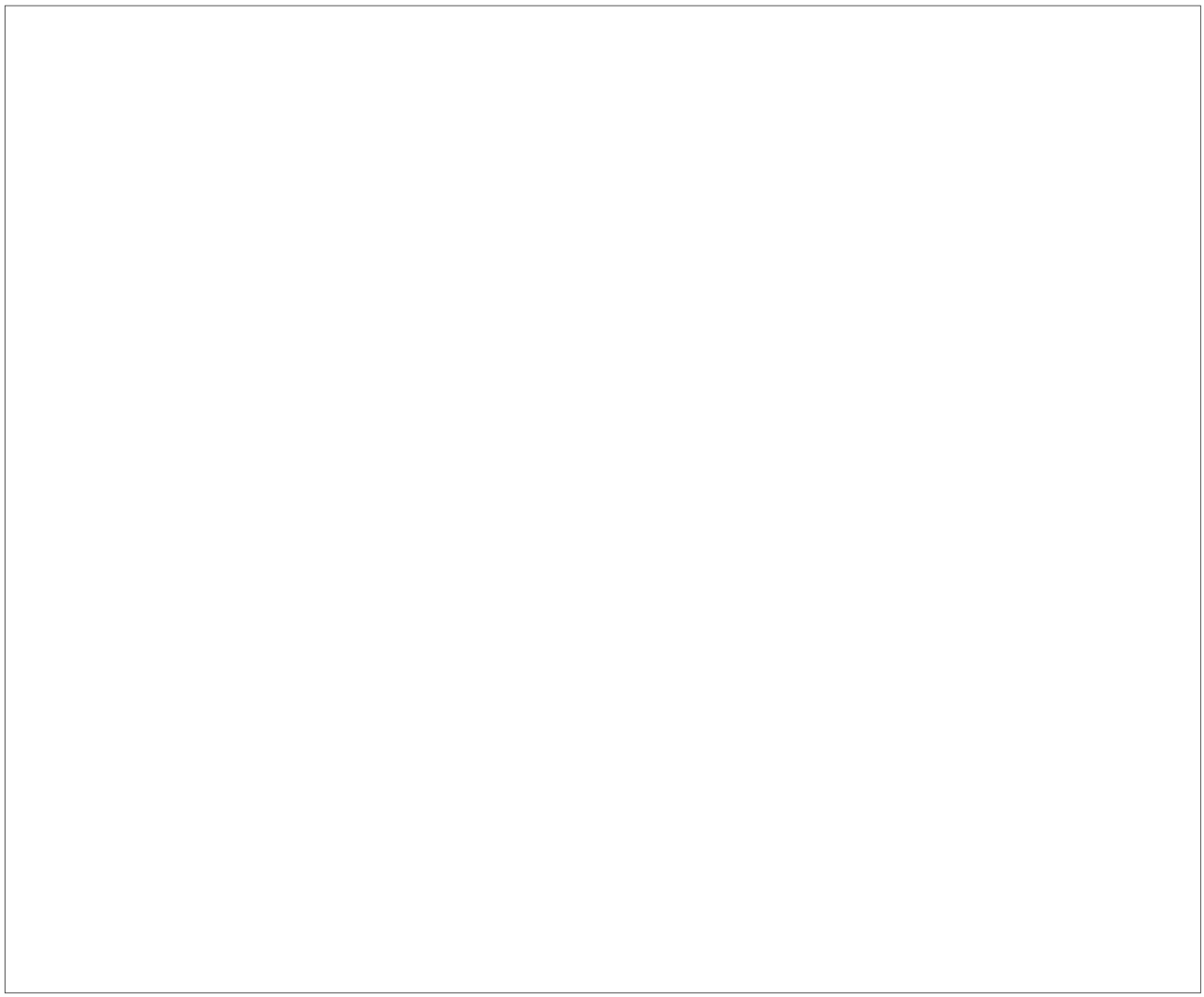
Figure 5



50X1

These physical characteristics enhance the dependability of communications in case of civil or military emergencies, a factor of major concern to North Korean authorities in the wake of the severe disruptions of facilities experienced during the Korean War.

Although targets for the development of the wireline network are ambitious in themselves, prospects for completion of the program are fairly good. Execution, however, will be contingent on continued high levels of assistance from the Bloc, inasmuch as domestic productive and technical resources will fall far short of program needs. Continuance of aid was evident in 1961, the first year of the new plan period, when more than 13,000 kilometers (km) of open wireline were consolidated and rearranged. These achievements may indeed be indicative of probable plan fulfillment. 50X1



(2) International

North Korea has point-to-point radio connections with 20 countries. These international circuits, as shown on the map, Figure 7,* radiate from the main station located at Pyongyang. For the most part, they carry only telephone and automatic and manual Morse service, but facsimile and teleprinter service is available to Peking. Other than the possible establishment of additional circuits for service with emerging states in Africa, no important change in network coverage is anticipated during 1961-67. As in the case of the domestic point-to-point radio network, the international network appears to be meeting minimum needs. Any changes that are made will be directed toward a better service with better equipment. 50/

c. Microwave

North Korea probably will install microwave radio relay facilities during the Seven Year Plan. The use of this multichannel medium is attractive not only because of its relatively low cost per channel but also because such use would introduce some degree of balance in a telecommunications system that is currently burdened by overdependence on one transmission medium -- wirelines.

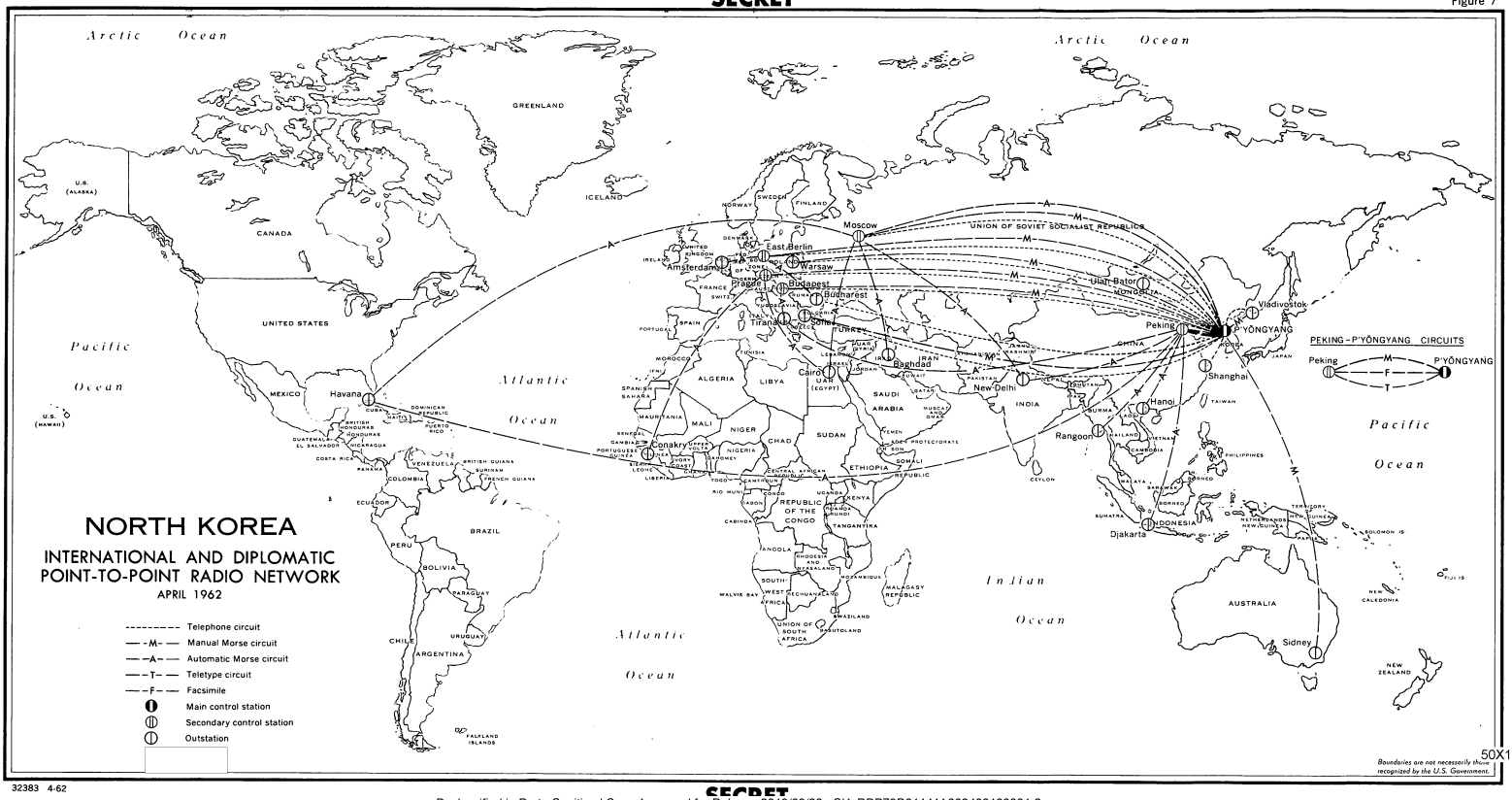
It is probable that Hungarian-made PM 24** microwave equipment will be used. This equipment is now in service in Communist China and in the Soviet Far East, and its introduction in North Vietnam is imminent. Initially, equipment would be installed on some main routes to supplement existing wirelines. In the long run, coverage may be extended to form a national backbone system that would carry telephone, telegraph, and broadcasting traffic between Pyongyang and the major areas of strategic activity. The system also may connect with the Soviet system at Vladivostok as well as that planned in Communist China. Besides handling conventional communications, it would carry air defense and other military traffic. If this change should come about, the telecommunications network of the Communist Far East would indeed be strengthened.

2. Functional Facilities

Facilities operated by the Ministry of Communications represent only a part of the telecommunications capability of North Korea. To meet their own specialized needs, other ministries and agencies operate independent functional networks that provide services not normally furnished by the general telecommunications system. Of these functional

* Following p. 26.
** The PM 24 carries 24 voice channels that operate in the range of 1,900 to 2,200 megacycles.

Figure 7



50X1

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networks, those operated by the Ministry of National Defense are the most important. Not only do they represent an appreciable segment of the total telecommunications resource base of the country, but also their status may be indicative of current or future courses of military activities. 50X1

[redacted]

b. Other

The specialized communications needs of the merchant shipping and civil air entities in North Korea are served by the networks

[redacted] 50X1

shown on the maps, Figures 13 and 14,* respectively. Because these networks appear to be meeting current needs, no radical changes in either equipment or coverage are anticipated.

V. Broadcasting

The broadcasting system of North Korea, rebuilt with Soviet aid from its shattered state at the end of the Korean War, now functions as an important means for furthering the propagandistic aims of the government. Controlled by the Central Broadcasting Committee,** the system offers domestic and international amplitude modulation (AM) radiobroadcasting and domestic wire diffusion services only. The Seven Year Plan for broadcasting stresses the further development of the wire diffusion network and the introduction of television service. Although not yet available, television service probably will be initiated in Pyongyang by mid-1962, and coverage should be extended to include most major cities by the end of 1967.

A. Radiobroadcasting

Organized in accordance with the administrative boundaries of the country, the radiobroadcasting network includes the Korean Central Broadcasting Station located at Pyongyang and regional stations located at most of the provincial capitals. For the most part the provincial stations rebroadcast programs originating in Pyongyang, but they do initiate some programs of regional interest. One of the more unusual features of the network is its use at the end of the day by Pyongyang to communicate to all regional stations program schedules and administrative instructions for the following day.

Shown on the map, Figure 15,*** the network comprises 16 medium-wave and 3 short-wave transmitters that are used interchangeably to provide domestic and international service. Domestic coverage is given by the Home Service, which carries programs in Korean throughout the day. International service consists of programs broadcast in Korean to South Korea, in Japanese and Korean to Japan, in English to the Far East, and in Mandarin to Communist China. During the last 2 hours of broadcasting, all transmitters are used for "barrage" transmissions to South Korea. In 1961 the weekly output for domestic service was considerably less than than that for international service, 78 hours compared with 151 hours. Of the total international program time, more than 127 hours were consumed by transmissions to South Korea. 53/

* Following p. 28.

** For a more detailed discussion of the Central Broadcasting Committee, see II, p. 5, above.

*** Following p. 28.

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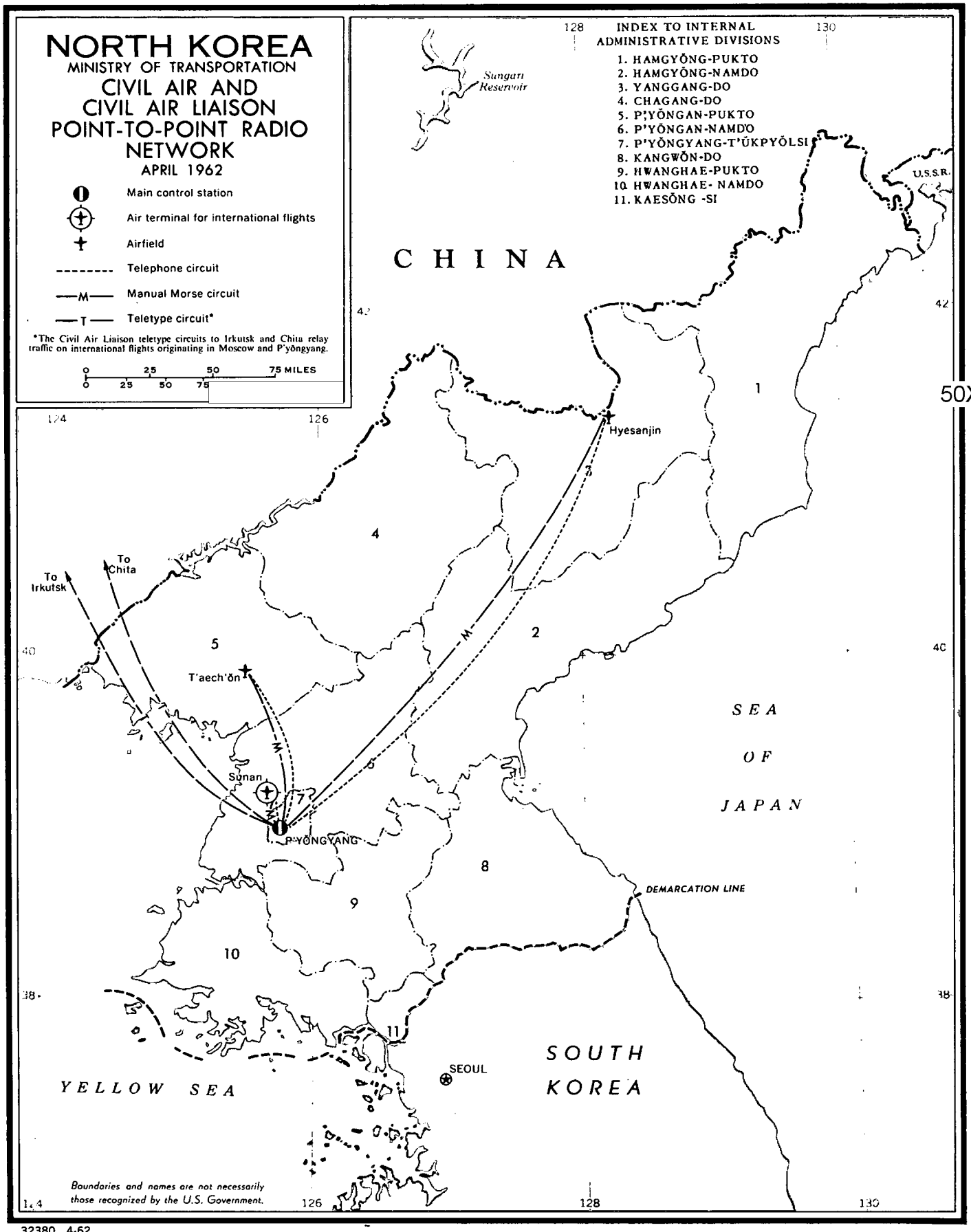
Figure 13



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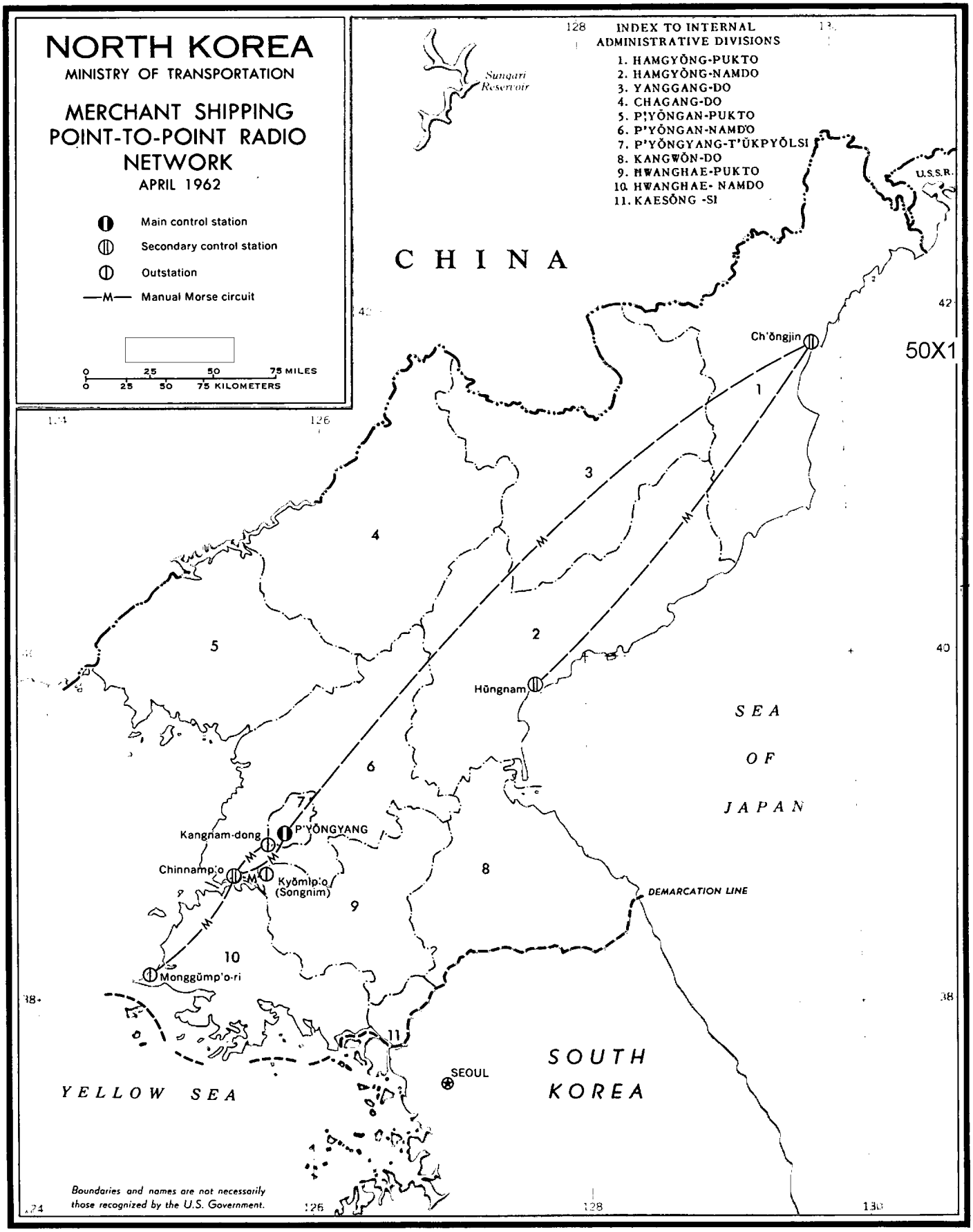
SECRET

Figure 14



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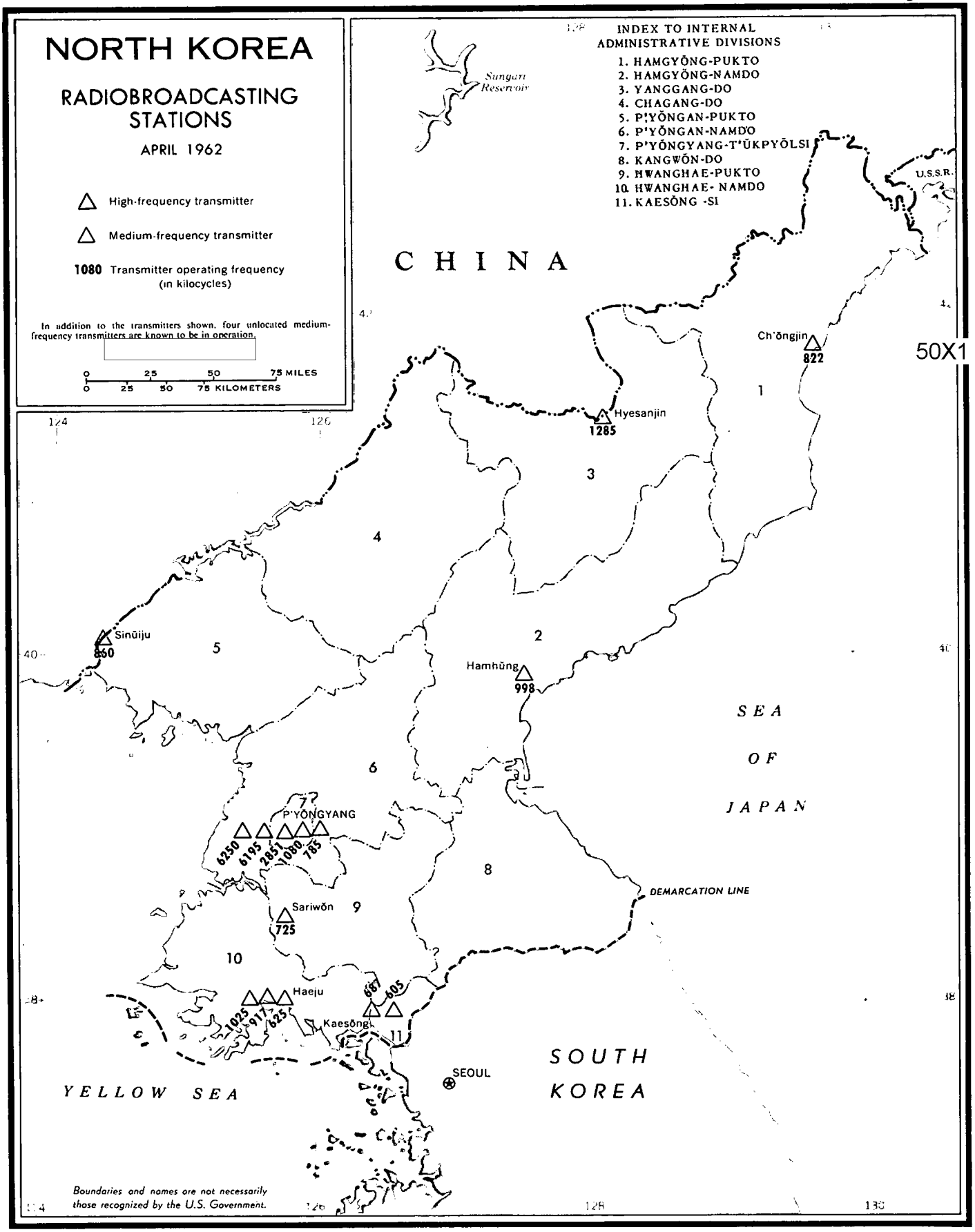
SECRET

SECRET

Figure 15



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SECRET

The performance of the radiobroadcasting network is barely adequate, at least for domestic service. With the exception of the medium-wave transmitter installed by the USSR in Pyongyang in 1955, transmission resources are composed solely of low-powered transmitters. Moreover, most of the transmitters display poor frequency stability and provide low-grade emissions. These operating characteristics as well as the practice of locating transmitter sites only at national or provincial capitals precludes effective service. Indeed, some areas of the country are barely covered, if covered at all.

In spite of its rapid growth, the radiobroadcast reception base in North Korea, as shown in Table 7,* is among the lowest in the Bloc. In 1960, there were approximately 149,000 radiobroadcast receivers in use, or about 14 receivers per thousand persons. The inadequacy of per capita coverage is highlighted by the fact that in North Vietnam in 1957 there were 20 receivers per thousand persons and in Albania in 1958, 19 receivers per thousand persons.

Little improvement is anticipated in radiobroadcasting service during 1961-67. Other than the possible installation** of a new 100-kilowatt medium-wave transmitter, which will be used both for extending the coverage of international broadcasts and for jamming broadcasts from South Korea and Japan, no major change is expected to occur in the size or power of the transmission base. Similarly, because of the high priority given to the expansion of wire diffusion service, per capita coverage of the radiobroadcasting reception base will remain inadequate even though it will be enlarged somewhat.

B. Wire Diffusion

Since 1953 the most conspicuous development in broadcasting in North Korea has been the rapid expansion of the wire diffusion network. By providing a "captive" audience, the network is one of the more important propaganda tools of the regime. As such, it is perhaps the most effective, if not the principal, medium of mass communications available for obtaining popular support for the government.

Growth in wire diffusion service during 1953-61, as shown in Table 8,*** has been outstanding. In 1953, there were about 5,000 loudspeakers in use, but by the end of 1961 the number approximated 794,000, representing 83 percent of the total broadcast reception base. Soviet†

* Table 7 follows on p. 30.

** In August 1961, North Korea was reported to be negotiating with the Japanese firm Toko Bussan Co., Ltd., for the purchase of a 100-kilowatt medium-wave transmitter. 54/

*** Table 8 follows on p. 31.

† Text continued on p. 32.

Table 7

Estimated Number of Radiobroadcast Receivers
in Use in North Korea
1953-61

Thousand

	1953	1954	1955	1956	1957	1958	1959	1960	1961
Radiobroadcast receivers in use	25 a/	41 b/	81 b/	104 b/	110 c/	116 d/	122 e/	149 f/	162 g/
Index of radiobroadcast receivers in use (1953=100)	100	164	324	416	440	464	488	596	648

a. In 1950, 100,000 radiobroadcast receivers were in use. 55/ The 1953 figure was computed by assuming that 75 percent of these receivers were destroyed during the war.
b. 56/
c. Interpolated, using graphic analysis.
d. 57/
e. Extrapolated by applying the absolute increase during 1958.
f. 58/
g. Extrapolated by applying the average annual absolute increase during 1958-60.

Table 8

Estimated Number of Wired Loudspeakers
in Use in North Korea
1953-61

Thousand

	1953	1954	1955	1956	1957	1958	1959	1960	1961
Wired loudspeakers in use	5 a/	11 b/	29 c/	43 c/	63 d/	108 e/	488 f/	634 g/	794 h/
Index of wired loudspeakers in use (1953=100)	100	220	580	860	1,300	2,200	9,800	13,000	16,000

a. 59/
b. 60/
c. 61/
d. 62/
e. 63/
f. 64/
g. 65/
h. 66/

aid was instrumental in advances made during the period of the Three Year Plan, but gains since then have been achieved mainly through the intensive use of domestic material and technical resources.

Patterned after similar networks in other countries of the Bloc, the wire diffusion network of North Korea uses telephone wirelines as the main medium for the transmission of wired broadcasts. It is unique, however, in that it also utilizes electric power lines for this purpose. Aided by the development of special but inexpensive equipment in 1958, broadcasting authorities have taken advantage of the extensive electrification of the country to provide service to rural areas not covered by telephone wirelines. Although such a transmission system does not reproduce high-quality signals, it nevertheless offers a simple and quick means for the indoctrination of the masses in the more remote areas of the country.

The Seven Year Plan for broadcasting gives high priority to the continued enlargement of the wire diffusion network. Besides directing the installation of sizable numbers of loudspeakers and the construction of separate wirelines to handle wired broadcasts, the plan emphasizes automatization of network operations through the installation of remote control apparatus. As a first step in this process, service between counties and villages will be automated. On completion of this task, which should be finished midway through the plan, automation of service between the counties, the provinces, and the national capital will begin. North Korea intends to carry out this program entirely with indigenous resources, but it is believed that the importation of some remote-control and wire broadcast relay equipment will be mandatory for full implementation.

VI. Future Trends

Displaying a high degree of resiliency, the post and telecommunications resource base of North Korea has improved appreciably since the end of the Korean War. Facilities heavily damaged during the war again are full functioning, and new ones have been added. Consequently, these resources now provide services to meet minimal needs. The Seven Year Plan prescribes continued development of this sector of the economy. Although targets of the present plan, now in its second year, are ambitious, prospects for completion of a large part of the program are fairly good. Of the many factors influencing the level of plan fulfillment, the most crucial will be the availability of large-scale technical and material assistance from other countries of the Bloc. Continuance of this aid, in fact, will assure a high level of fulfillment.

APPENDIX A

GLOSSARY OF TECHNICAL TERMS

Amplitude modulation (AM): The process by which a selected carrier frequency is varied in magnitude (amplitude) by other frequencies that contain the information to be transmitted in telecommunications. (See Frequency modulation.)

Apparatus: Instruments, machines, appliances, and other assemblies used in providing a telecommunications facility.

Automatic (as an adjective): Of or pertaining to any process involved in producing telecommunications service that does not require direct, immediate human assistance.

Band (of frequencies): The entire range of frequencies between two numerically specified frequency limits. The magnitude of this range is a limiting factor on the amount of information that can be transmitted in telecommunications. With respect to frequencies of the radio spectrum as a whole, the International Telecommunication Union has for convenience divided the whole radio spectrum into eight major bands, as follows:

Frequency Bands		
Range	Type	Corresponding Wave* Band
Up to 30 kc**	Very low frequencies (VLF)	Myriametric waves
30 to 300 kc	Low frequencies (LF)	Kilometric waves
300 to 3,000 kc	Medium frequencies (MF)	Hectometric waves
3,000 to 30,000 kc	High frequencies (HF)	Decametric waves
30,000 kc to 300 mc***	Very high frequencies (VHF)	Metric waves
300 to 3,000 mc	Ultra high frequencies (UHF)	Decimetric waves†
3,000 to 30,000 mc	Super high frequencies (SHF)	Centimetric waves†
30,000 to 300,000 mc	Extremely high frequencies (EHF)	Millimetric waves†

* Waves are undulating disturbances: a sound wave is a disturbance in the air, which is an elastic medium, and an electric wave is a disturbance in any medium whatever. The number of waves per second is the frequency of a given wave. Because the speed of wave propagation is considered to be constant, the length of a given wave is in inverse relation to its frequency: the longer the wave length, the lower the frequency; and the shorter the wave length, [footnote continued on p. 34]

Cable: A bundle of sheathed, insulated wires and/or coaxial tubes used as a telecommunications medium. It is sometimes referred to as "multiconductor cable."

Carrier (as an adjective): Of or pertaining to a technique for dividing a circuit, lane, supergroup, group, or channel into portions that can be used independently of and simultaneously with all other portions. Different frequencies or different pulses are selected for each portion to "carry" the information to be transmitted, after alteration by the information frequencies. The carrier itself need not be transmitted.

Channel: A portion, electrical or physical, of a telecommunications circuit, lane, supergroup, or group that can be used to transmit information independently of and simultaneously with all other portions. A channel may be used to provide two or more subchannels.

Circuit: A telecommunications connection between two or more distant points by a wire, cable, or radio medium facility used to carry information. The circuit is the fundamental telecommunications connection between distant points. By the application of appropriate techniques, a circuit may be arranged in many different combinations to meet the need for various kinds and quantities of telecommunications service. In its simplest form a circuit may carry only single telecommunications units in sequence. In its most complex form it may by apportionment carry simultaneously thousands of telephone channels and telegraph subchannels; a number of television programs; and other specialized kinds of service, such as high-fidelity broadcast programs, radar signals, and data-processing signals.

For the most complex application, a circuit is often arranged into lanes, each of which can carry, in one direction, 1 television program or up to 1,800 telephone channels. In turn, these 1,800 telephone channels are subdivided into 10 supergroups of 60 telephone channels each. Each supergroup is subdivided into 5 groups of 12 telephone channels each. One or more telephone channels may be further subdivided into 3 to 20 sixty-word-per minute teletype subchannels. Other specialized kinds of service may be accommodated by combining two or more telephone channels.

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the higher the frequency. Wave length usually is measured in linear units of the metric system.

** Kilocycles per second, or 1,000 cycles per second.

*** Megacycles per second, or 1 million cycles per second.

† It is becoming common usage to refer to waves (frequencies) in these three bands as "microwaves."

Coaxial (as an adjective): Of or pertaining to a modern telecommunications cable medium technique using one or more tubes (sometimes called "pipes"). Each metal tube surrounds a conducting wire supported concentrically by insulators. The space in the tube usually contains nitrogen gas under pressure. Generally, coaxial cable is used for the transmission of information in complex form, such as radar, computer data, or television signals, and/or for the transmission of telephone channels and telegraph subchannels. A single tube usually carries information in only one direction at a time. The capacity of a tube depends in part on the distance between repeater stations. In the standard facility, which may have from 2 to 8 tubes in the cable, a single tube carries a lane of up to 1,800 telephone channels or 1 television lane, for which the repeater station spacing is about 7 statute miles. In a new developmental coaxial cable facility, a single tube may carry 3 lanes of a total of 1,800 telephone channels or 3 television lanes, for which the repeater station spacing is expected to be about 3 statute miles.

Electronics: A general term used to identify that branch of electrical science and technology which treats of the behaviour of electrons in vacuums, gases, or solids. Today telecommunications makes extensive use of electronic technology.

Facility: An association of apparatus, material, and electrical energy required to furnish telecommunications service.

Facsimile (as an adjective): Of or pertaining to a telecommunications (telegraph) service in which photographs, drawings, handwriting, and printed matter are transmitted for graphically recorded reception. In one method (Type A), images are built up of lines or dots of constant intensity. In another method (Type B), images are built up of lines or dots of varying intensity, sometimes referred to as "telephoto" and "photoradio."

Feeder (as an adjective): Of or pertaining to telecommunications facilities of relatively low capacity that join facilities of relatively high capacity. (See Main.)

Frequency: The rate in cycles per second at which an electric current, voltage, wave, or field alternates in amplitude and/or direction. (See Band.)

Frequency modulation (FM): The process by which a selected carrier frequency is varied in frequency by other frequencies that contain the information to be transmitted in telecommunications. (See Amplitude modulation.)

Functional (as an adjective): Of, pertaining to, or connected with special, unique, or particular telecommunications facilities managed and operated by a single agency, organization, company, department, committee, ministry, or other entity, in contrast to the facilities of a basic system. (See Basic system.)

Group: A number of channels (usually 12) or subchannels combined (multiplexed) electrically in building up the total capacity of a telecommunications circuit, lane, or supergroup.

Ionosphere: Those layers of the earth's atmosphere occupying the space about 210 statute miles in thickness extending from about 30 statute miles above the earth's surface to the outer reaches (exosphere) of the atmosphere. Reflection from these layers makes possible long-distance transmission of radio signals. The layers, however, are responsible for fading of signals, skip distance, and differences between daytime and nighttime radio reception. The layers also are used as a scattering reflector for ionospheric scatter-transmission techniques to transmit to distances of about 1,000 to 1,500 statute miles.

Joint facility: A telecommunications facility owned, controlled, or operated by two or more agencies, organizations, companies, departments, committees, ministries, or other entities.

Lane: A one-way portion, electrical or physical, of a two-way telecommunications circuit that can be used independently of and simultaneously with all other portions. The largest lane today can handle 600 telephone channels or 1 television program. In some applications the direction of a lane may be reversed.

Leased (as an adjective): Of or pertaining to the direct operation by a user of a telecommunications facility owned by another agency.

Line: A general term used to delineate a telecommunications circuit facility (wire, cable, or radio).

Main (as an adjective): Of or pertaining to telecommunications facilities at and between principal cities and centers that have relatively high capacity compared with feeder facilities. (See Feeder.)

Medium: Any substance or space that can be used practically to transmit a form of electrical energy for the purpose of providing telecommunications service.

Microwave radio relay (as an adjective): Of or pertaining to a radio medium technique in modern telecommunications employing radio frequencies higher than 300 mc. These frequencies normally do not afford

practical direct transmission to great distances, principally because they do not bend well around the earth's surface and because they do not reflect well from the ionosphere. They are, however, capable of reliable transmission from horizon to horizon (line-of-sight) by the use of special antennas that concentrate the radio energy and give it desired direction. In consequence, great distances can be reached by this technique by the interposition of relay stations along the route of the line with a spacing interval of from 25 to 40 statute miles, depending on terrain conditions. This technique can be employed practically to carry from a small number of telephone channels and telegraph subchannels to thousands of such channels and subchannels through two or more lanes and to carry one of more television and other specialized lanes and channels. (See Band.)

Mobile (as an adjective): Of or pertaining to a telecommunications facility that is intended to be operational while in motion or during halts at unspecified points. (See Portable.)

Modulation: The process of altering a carrier frequency or carrier pulses by other frequencies or pulses representing the information being transmitted.

Multiplex (as an adjective): Of or pertaining to the combining of information signals, modulated or unmodulated, of two or more lanes, supergroups, groups, channels, or subchannels for transmission over the same circuit.

Network: An interconnection, electrical or physical, of two or more circuits or portions thereof for the purpose of facilitating telecommunications service.

Point-to-point (as an adjective): Of or pertaining to telecommunications service between fixed points, using the radio medium.

Portable (as an adjective): Of or pertaining to a telecommunications facility that can be readily moved from place to place but normally is not operational while in motion. (See Mobile.)

Private (as an adjective): Belonging to or concerning an individual person, organization, institution, or activity; not public or common.

Pulse: A spurt of electrical energy of extremely short duration (usually measured in millionths of a second) yet capable of being used in telecommunications to transmit information.

Quad: In a multiconductor telecommunications cable, the physical association of a group of four conductors in any one of various arrangements for the purpose of providing two-way multichannel operation.

Reception base: The aggregate telecommunications receiving facilities employed in providing a broadcast service.

Route: The geographical path followed by a wire, cable, or radio line.

Scatter (as an adjective): Of or pertaining to a radio medium technique in modern telecommunications by which energy in radio frequencies above 30 mc is deliberately scattered into one or the other of two reflecting portions of the atmosphere (troposphere and ionosphere) at such a predetermined angle that a usable portion of the energy arrives at the desired receiving location. This technique is especially applicable to regions in high latitudes (Arctic and Antarctic) where facilities of other media suffer from the rigors of weather and terrain and where the conventional long-distance radio media of the lower frequency bands (200 kc to 30 mc) are subject to serious disruptive propagational anomalies. (See Band.)

Subchannel: A portion, electrical or physical, of a telecommunications channel that can be used independently of and simultaneously with all other portions. An appreciable number of telephone channels usually can be subchanneled to carry from 3 to 20 sixty-word-per-minute teletype subchannels on each telephone channel so employed.

Subscriber: Any customer who directly operates telecommunications apparatus in obtaining telecommunications service.

Supergroup: A number of groups (often five) combined (multiplexed) electrically in building up the total capacity of a telecommunications circuit or lane.

System: All of the facilities and networks managed by a single agency, organization, company, department, committee, ministry, or other entity in rendering either functional or basic telecommunications service.

Telecommunications: Transmission, reception, or exchange of information between distant points by electrical energy over a wire, cable, or radio medium facility to produce telephone, telegraph, facsimile, broadcast (aural and visual), and other similar services.

Teletype (as an adjective): Of or pertaining to a technique for effecting telegraph service by the use of an apparatus similar to a typewriter in which information is transmitted by keyboard and received by type printer on a roll of paper or tape or by perforations on a roll of tape or both. The apparatus is sometimes called a "teleprinter" or a "teletypewriter."

Transmission base: The aggregate telecommunications transmitting facilities employed in providing broadcast service.

Transistor: A modern device that is capable of performing in a solid (germanium or silicon) many of the functions performed by the conventional electronic tube in a gas or vacuum.

Troposphere: The layer of the earth's atmosphere occupying the space from the earth's surface to a height of about 6 statute miles. This layer is used as a scattering reflector for tropospheric scatter-transmission techniques to distances of about 200 to 500 statute miles.

Wave guide (as an adjective): Of or pertaining to a telecommunications medium, now under development in several countries, that may be capable of transmitting extremely large amounts of conventional and complex information. It consists of a circular or rectangular hollow metallic tube in which electrical energy travels in the form of waves, much as do sound waves in a speaking tube.

Wire diffusion: Distribution of broadcast programs by a wire or cable medium to wired loudspeakers.

Wired loudspeaker: A telecommunications loudspeaker that receives from a distribution point one or more broadcast programs by a wire or cable medium.

Wireline: A general term used to identify a line consisting of either an aerial cable (and/or separate wires) or an underground cable used as a telecommunications medium.

APPENDIX B

METHODOLOGY

Most of the statistical data in this report were developed from information contained in the Statistical Yearbook for North Korea, 1959.

[redacted] 50X1

The specific methodology used in the computation of each statistical series, [redacted] is contained in the footnotes to the tables. 50X1

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